AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remains under examination in the application are presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough; and 2. added matter is shown by underlining.

Claims 1-28 (Cancelled).

Please add new claims 29-62 as follows:

29. (New) A microscope arrangement, comprising

an illumination source having optical components for generating an illumination beam path;

a lens through which the illumination beam path is directed onto a sample located in or in proximity of an object plane of the lens;

optical components for generating an imaging beam path directed onto a receiving surface of a camera, and

a homogenizing unit to homogenize the intensity of illumination light that is incident on the sample section to be examined.

30. (New) The microscope arrangement as recited in Claim 29, wherein the homogenization unit comprises a fiber-optic waveguide including a receiving surface facing the illumination source and an opposing emitting surface.

31. (New) The microscope arrangement as recited in Claim 30, wherein the fiber-optic waveguide comprises an internally reflective hollow rod, a totally internally reflective, transparent solid rod, a liquid fiber-optic waveguide or a bundle of glass fibers.

32. (New) The microscope arrangement as recited in Claim 30, wherein the optically active cross-section of the fiber-optic waveguide is formed to be circular, square or rectangular.

33. (New) The microscope arrangement as recited in Claim 30, wherein the receiving surface, the emitting surface or both the receiving surface and the emitting surface of the homogenization unit comprises a microlens structure.

34. (New) The microscope arrangement as recited in Claim 33, wherein the microlens structure comprises a plurality of round, square, honeycomb-shaped or cylindrical micro-lenses, each having a line radius of approximately 100 μm to 1000 μm, disposed adjacent to one another.

35. (New) The microscope arrangement as recited in Claim 29, wherein the homogenization unit comprises

- first and second optical components including micro-cylinder lenses, arranged in sequence in the illumination beam path, wherein

- the axes of the micro-cylinder lenses on the first and second components are oriented to be substantially perpendicular to an optical axis of the illumination beam path; and

wherein the axes of the micro-cylinder lenses of the first component are at substantially right angles to the longitudinal direction of the micro-cylinder lenses of the second component.

36. (New) The microscope arrangement as recited in Claim 30, further comprising first imaging optics imaging the emitting surface in a field aperture plane and second imaging optics imaging the field aperture plane in a lens plane.

37. (New) The microscope arrangement as recited in Claim 29, further comprising a field aperture having an optically active surface comprising alternate transparent and non-transparent partial surfaces.

38. (New) The microscope arrangement as recited in Claim 37, wherein the optically active surface of a field aperture is structured to be a strip pattern or chessboard pattern.

39. (New) The microscope arrangement as recited in Claim 37, wherein a controllable shutter for darkening selected surface sections of the field aperture is disposed in front of the field aperture.

40. (New) The microscope arrangement as recited in Claim 37, further comprising

a partially permeable diversion mirror disposed downstream from the field aperture in the illumination beam path which diverts a predominant portion of illumination light to be guided through an illumination tube that parallelizes the illumination beam path, and

a first spectral filter for selection of a fraction of the illumination light intended for excitation

a color splitter following the first spectral filter, which guides a predominant portion of illumination light through the lens and onto the sample.

41. (New) The microscope arrangement as recited in Claim 40, in which the color splitter comprises a dichroitic mirror, or a partially transparent mirror

42. (New) The microscope arrangement as recited in Claim 40, wherein

- light emitted by fluorescence of the sample passes back through the lens,
- passes through the splitter surface of the color splitter and,
- subsequently through a second spectral filter, which transmits the emitted light, and reaches
- the camera through an imaging tube.

43. (New) The microscope arrangement as recited in Claim 42, characterized in that the illumination tube and the imaging tube are formed from substantially identical optical components.

44. (New) The microscope arrangement as recited in Claim 42, in which a removable equalizing glass is disposed in front of the lens, whereby measurements of the sample can be taken with the equalizing glass, on an air/solid object contact surface of the sample facing the lens or, without the equalizing glass, through a transparent sample carrier.

45. (New) The microscope arrangement as recited in Claim 29, wherein a fraction of the illumination light passing through the partially transparent diversion mirror is directed onto a monitor detector, which serves to monitor intensity of the illumination light.

46. (New) The microscope arrangement as recited in Claim 41, wherein planar normals of the first and second spectral filters and the optical axis of the illumination beam path and the optical axis of the imaging beam path have an angle in the range of about 1 degree to about 20 degrees.

47. (New) The microscope arrangement as recited in Claim 46, wherein planar normals of the spectral filters and the optical axis of the illumination beam path and the optical axis of the imaging beam path have an angle of about 5°.

48. (New) The microscope arrangement as recited in Claim 41, wherein the first spectral filter in the illumination beam path and the second spectral filter in the emission beam path, together with the color splitter, are structured as a first filter cube.

49. (New) The microscope arrangement as recited in Claim 48, wherein the first filter cube is disposed with at least a second filter cube, which differs from the first filter cube with respect to its configuration for the excitation and emission wavelengths of the illumination light, on a changing device,

50. (New) The microscope arrangement as recited in Claim 49, wherein the changing device comprises a change wheel.

51. (New) The microscope arrangement as recited in Claim 29, wherein a grayscale filter pivots in the illumination beam path against an optical axis of said illumination beam path, wherein a planar normal on an incident light surface of the grayscale filter and the optical axis of the illumination beam path make an angle in the range of about 5° to about 15°.

52. (New) The microscope arrangement as recited in Claim 29, wherein the illumination source is connected to the remaining components of the microscope arrangement by a detachable mechanical connection.

53. (New) The microscope arrangement as recited in Claim 29, wherein the lens is arranged to be displaceable on a slide bar substantially parallel to its optical axis and is coupled with a motor-driven adjustment device.

54. (New) The microscope arrangement as recited in Claim 29, wherein the lens and at least one other lens, which differs from the first lens with respect to its optical properties, are disposed on a changing device.

55. (New) The microscope arrangement as recited in Claim 29, wherein the changing device comprises a lens revolver.

56. (New) The microscope arrangement as recited in Claim 29, wherein

- an autofocusing device is provided that comprises an autofocus laser, an autofocus sensor and an autofocus actuating mechanism, and
- an autofocus laser beam bundler in the illumination beam path.

57. (New) The microscope arrangement as recited in Claim 29, wherein the camera comprises a CCD or CMOS camera.

58. (New) The microscope arrangement as recited in Claim 29, wherein the optical axis of the lens is oriented to be perpendicular to the direction of gravity.

59. (New) The microscope arrangement as recited in Claim 29, further comprising a sample table adjustable in coordinate directions X and Y perpendicular to the optical axis of the lens to support a sample, wherein coordinate direction Y is aligned parallel to the direction of gravity.

60. (New) The microscope arrangement as recited in Claim 59, wherein the sample table is coupled to a piezo drive and a spindle drive, wherein the piezo drive controls adjustment in coordinate direction X and the spindle drive controls adjustment in coordinate direction Y.

61. (New) The microscope arrangement as recited in Claim 60, wherein the sample table is operably connected to a leveling device used to adjust the incline of the sample surface relative to the optical axis of the lens.

62. (New) The microscope arrangement as recited in Claim 59, wherein the sample is supported on the sample table by a sample holder, the sample holder and the sample table being detachably connectable to one another.